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E1G GLR G762
A3V V9B2X

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(58) Field of Search

UK CL (Edition T) A3V, E1G GLR
INT CL⁷ A41D, A41F, A62B, A63K, F21V
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(54) Abstract Title

Visibility-enhancing belt for use by cyclists, pedestrians etc.

(57) The visibility-enhancing device, for use by cyclists, horse riders, runners and other pedestrians etc., has a housing 1 comprising an illuminable display panel, a location for a power supply 8 for the panel and a stowage means 9 for stowing a belt 4 for securing the device around the waist of a user, with the stowage means acting so that the belt can be moved between a deployed configuration where it is substantially outside the housing and a stowed configuration where it is located substantially within the housing. The stowage means preferably comprises a spring-loaded reel that urges the belt in to the housing. The display panel may be formed using incandescent bulbs 7 or light emitting diodes, is connected to the power supply via a switch 6 and may include retro-reflective material 2. The belt may be luminous and the housing may include a clip with which the housing can be secured to a belt etc. when not in use. The belt may be deployed from a single side of the housing and have its free end secured to a securing mechanism 5 which forms part of the housing or alternatively the belt may be deployed simultaneously from opposite sides of the housing with both free ends including inter-engaging securing mechanisms with which they may be secured together. The panel may not be lite but instead be purely reflective.

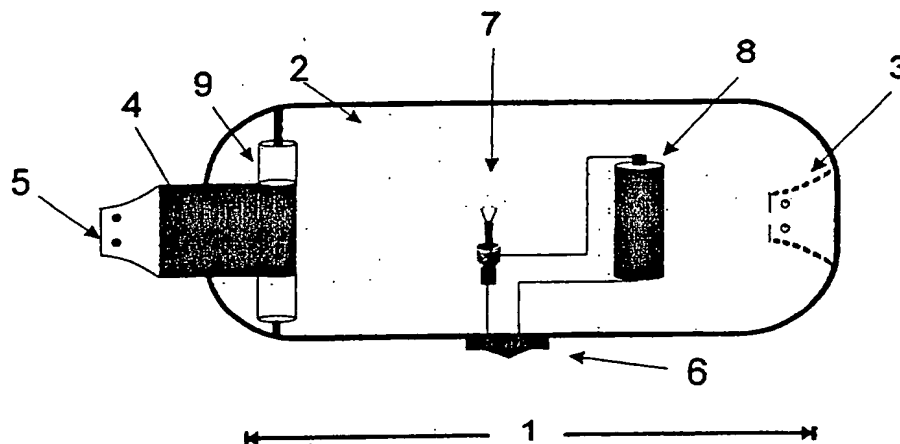
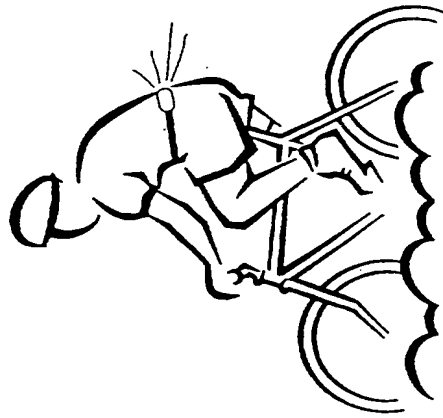


Figure 5

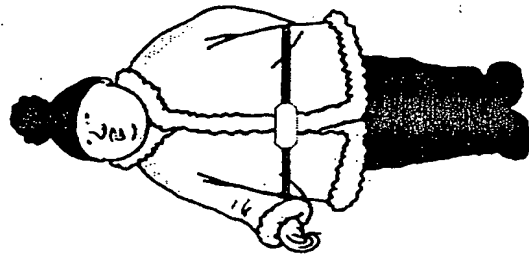
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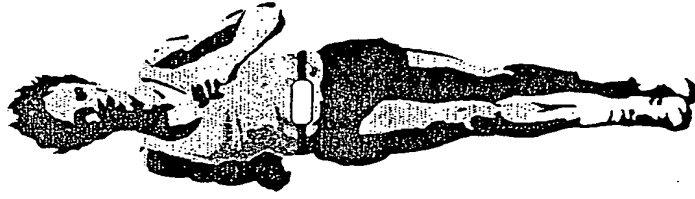
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(A)



(B)



(C)

Figure 1

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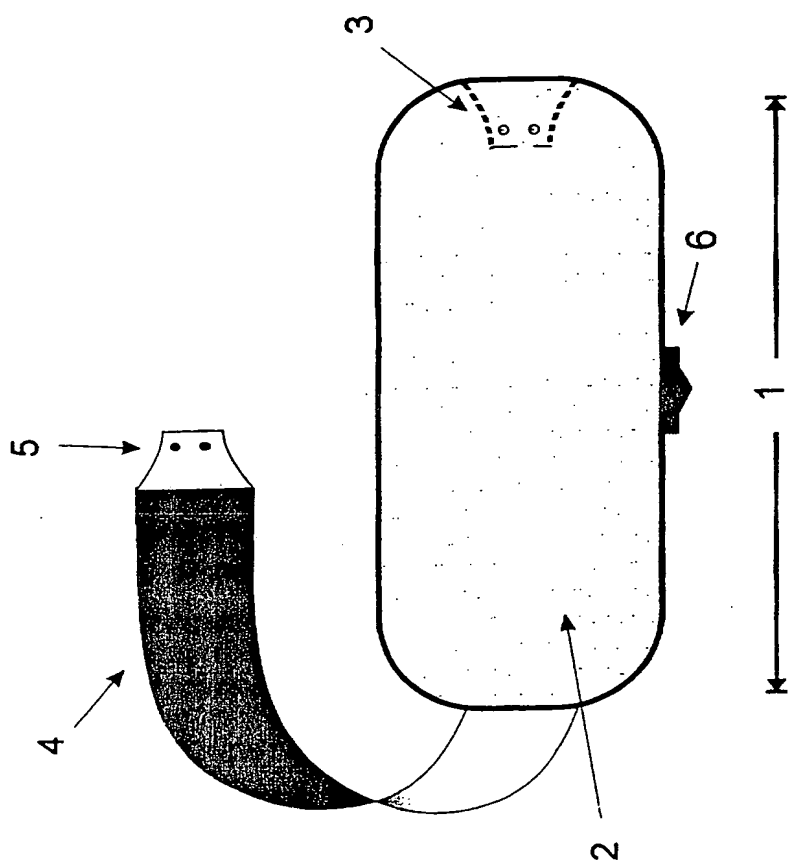


Figure 2

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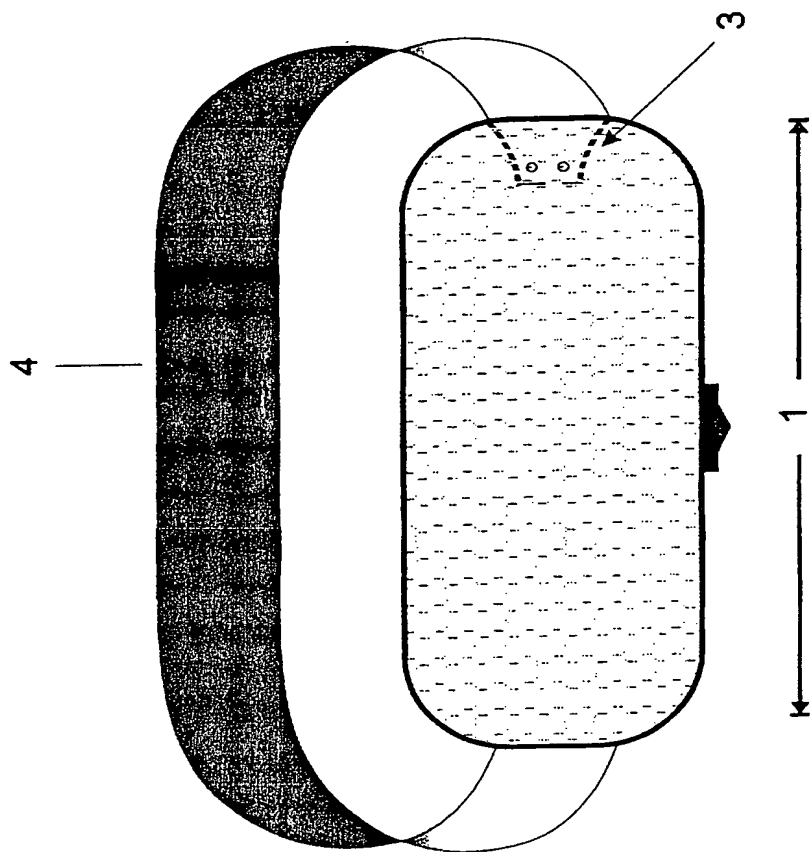


Figure 3

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4/9

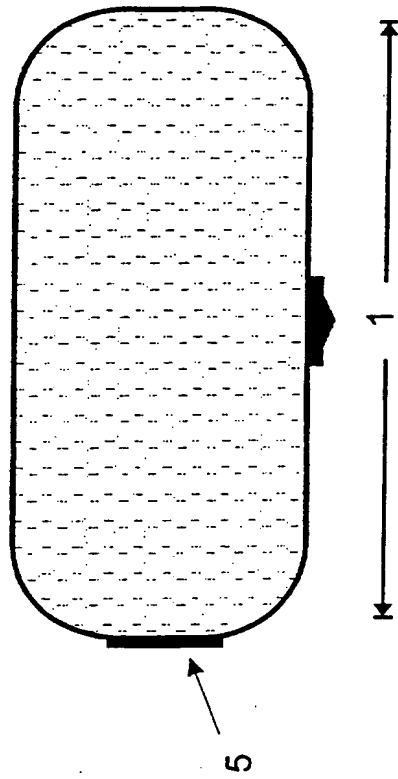


Figure 4

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5/9

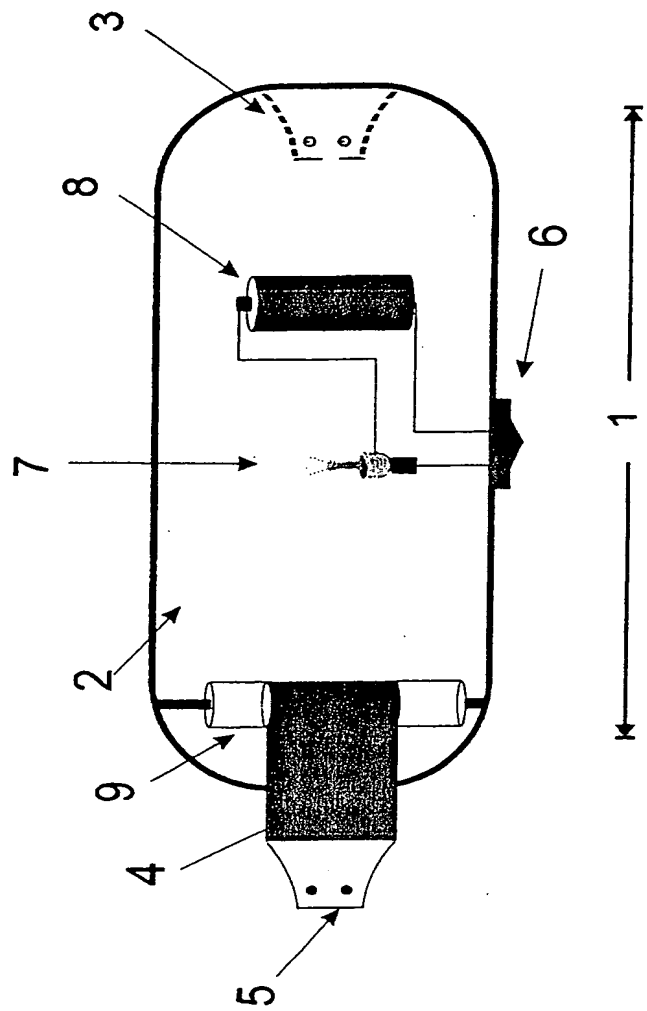
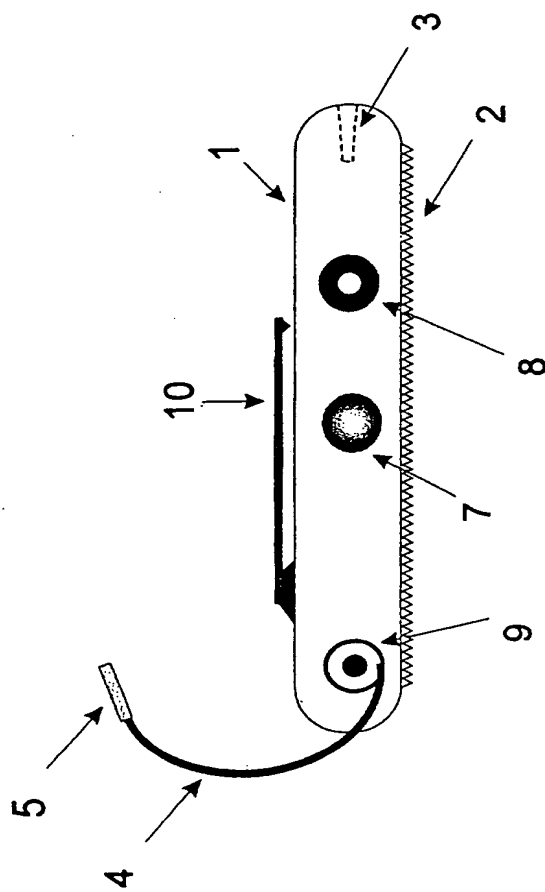


Figure 5

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6/9

Figure 6

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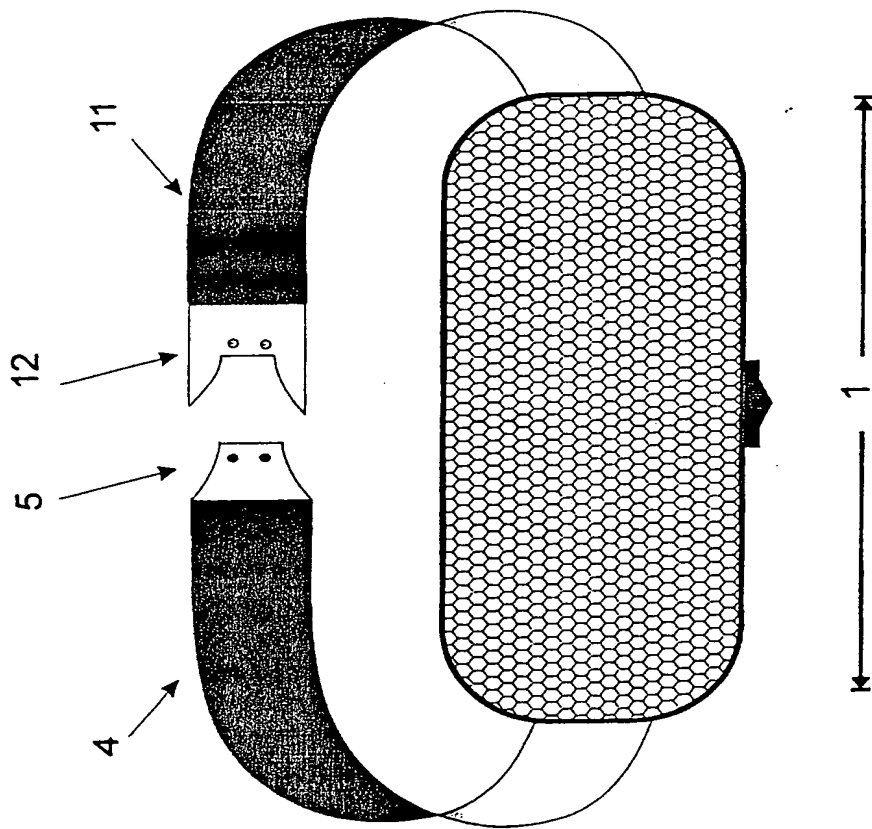


Figure 7

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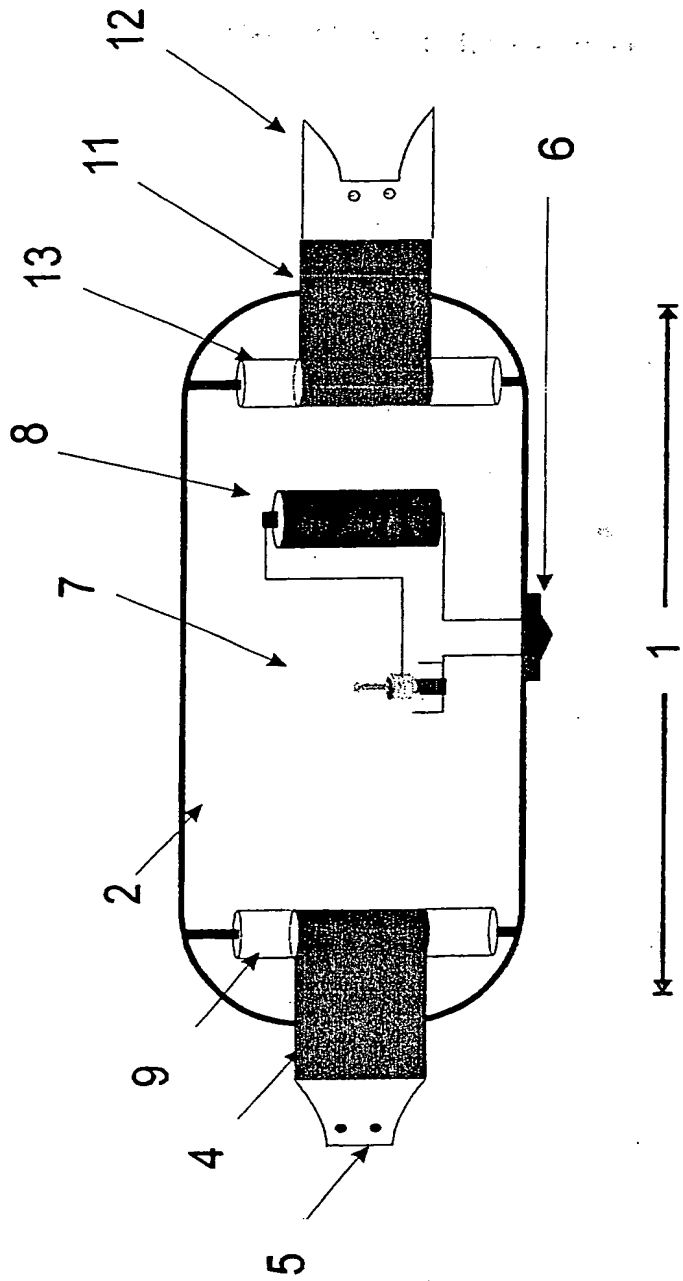


Figure 8

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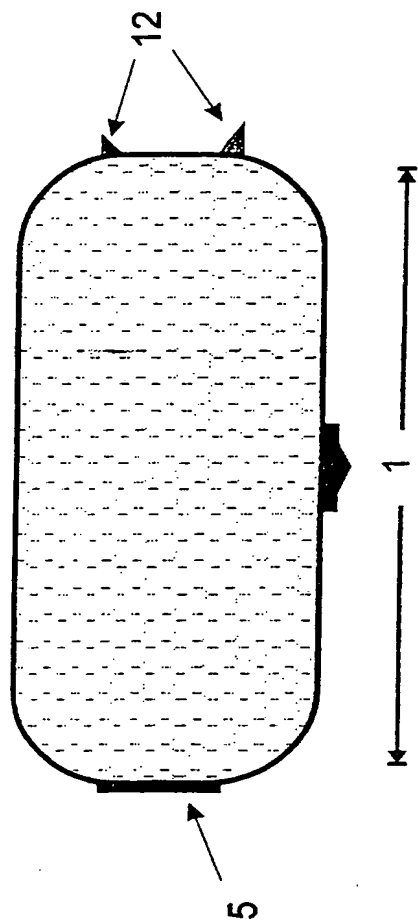


Figure 9

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Safety Device

The present invention relates to safety devices for enhancing the visibility of road users such as cyclists, horse riders and pedestrians and more generally to persons requiring enhanced visibility.

Many accidents are caused by failure of vehicle drivers to notice other road users. It is known to use luminous belts to enhance the visibility of road users such as cyclists or pedestrians at night. However, luminous belts and the like can be fairly bulky to store after use. It is also known to use lamps and reflective devices mounted to bicycles for enhancing visibility. However, these devices must be mounted on specific dedicated brackets on the bicycle and are therefore not universally mountable nor are they suitable for pedestrians.

According to the present invention, there is provided a device for enhancing the visibility of a wearer which includes a housing comprising: an illuminable display panel, a location for a power supply for the illuminable display; a stowage means for stowing a belt for securing the device around the wearer, wherein the stowage means enables the belt to be moved from a deployed configuration in which the belt is substantially located outside the housing to a stowed configuration in which it is substantially within the housing.

Preferably the stowage means includes a spring-loaded reel, a portion e.g. an end of the belt may be mounted on the spring-loaded reel. Preferably the stowage means e.g. the spring-loaded reel may be loaded so that it urges the belt mounted thereon into the stowed configuration. Thus when the belt is not in the deployed configuration e.g. wrapped around the wearer so as to secure the safety device to the wearer, the spring-loaded reel coils or winds the belt due to the spring loaded action into the stowed configuration. The belt may thus be readily and quickly stored compactly within the housing after use.

The illuminable display panel may be a conventional cycle lamp or the like. Preferably the illuminable display panel is a flashing display panel.

Preferably, the display panel has a retro-reflective surface.

Preferably the belt will be of a retro-reflective material, this will further enhance the visibility of the wearer. Preferably the belt will be made from a luminous material, thereby increasing visibility of the wearer.

Preferably the housing further comprises attachment means to which a portion of the belt may be attached so as to secure the belt in the deployed configuration.

Thus the device may be worn by unreeling the belt from the housing and wrapping it around the wearer, the end of the belt being fixed by means such as a clip or buckle to the attachment means located on the housing. After use the belt may be detached from the attachment means. The spring-loaded reel thus retracts the belt into the stowed configuration in which it is located securely and compactly within the housing.

Thus the safety device is easily storable in a pocket, or clipped to a belt. The device may be approximately the size of a mobile phone, which can be readily stored.

Embodiments of the present invention will now be described by way of example, with reference to the accompanying drawings in which:-

Fig.1: Illustrates the use of the current device to enhance the visibility of users by way of examples (a) of cyclists, with the device to the rear of the cyclists in this example, (b) of pedestrians with the device to the front in this example, (c) of a jogger with the device to the front in this example.

Fig.2: Shows a schematic of the device, seen from the front, consisting of housing 1 with a front retro-reflecting surface 2 to increase visibility. The housing contains on one side an attachment means 3 forming an internal part of the housing. From the opposite side of the housing extrudes a belt 4 fitted with securing mechanism 5, such as a clasp or buckle. A switch 6 allows the powering of a light source behind the retro-reflective display thereby forming an illuminable display panel

Fig. 3: Shows the device in the deployed position in which the belt 4 is deployed from the housing 1 and is secured to the mechanism 3, thereby forming a closed loop which allows the device to be secured around a person or object.

Fig. 4: Shows the device in the stowed position, in which the belt is fully retracted into the housing 1. A part of the securing mechanism 5 protrudes from the housing in order that the belt may be withdrawn from the housing for deployment.

Fig.5: Shows a schematic illustration of the construction of the device in Fig.2. Fig. 5 shows the view from the front including housing 1 with retro-reflective surface 2 to the front. There is an internal illumination means consisting of a light source 7 with a corresponding power unit 8 attached. The power unit and light source are electrically connected via a switch 6, external to the housing, which allows the light source to be turned on or off.

On one side of the housing, and internal to it, is a stowage means such as a spring-loaded reel 9. Attached to the stowage means 9 is a belt 4 with securing mechanism 5. The opposite side of the housing contains a retaining mechanism 3, such as a clasp retainer, which serves to secure the mechanism 5 when the belt is withdrawn from the housing and deployed. In the figure, parts 3,7,8, 9 and a portion of belt 4 are all internal to the housing 1.

Fig. 6: Shows a view from the top of the device in Fig. 5. The retro-reflecting surface 2, shown to the front of the device, enhances the visibility of the illumination source 7, which is attached to the power unit 8. Not shown is the switch 6 for powering the device, which is under the housing 1 in this figure. One side of the housing contains the stowage means 9, consisting of a spring-loaded reel, to which is attached the belt 4 with securing mechanism 5. The attachment means 3 is shown on the opposite side of the housing and is internal to the housing. Also shown is a clip mechanism 10 to the rear of the housing 1, which is used to clip the device after use, for instance to a trouser belt for storage. The device is shown with the belt 4 in an unclasp deployed position.

In this figure, objects 3, 7, 8, 9 and a portion of the belt 4 are all internal to the housing 1.

Referring now to Fig. 1, which shows examples of the use of the present device for enhancing the visibility of various types of user. Fig. 1a shows the device in the deployed configuration wrapped around cyclists with rear deployment where the illuminable display is to the rear of the wearer in this example. Fig. 1b shows the device in deployed position on

a pedestrian with the device deployed in the front position. Fig. 1c show the device in the deployed position around a jogger with the device deployed in the front position. The device can be used for any other application where enhanced visibility is required.

Referring to Fig.2. There is provided a housing 1 comprising an illuminable display with a retro reflecting surface 2. The device has a belt 4 that allows the housing to be secured around an object or person. The belt is secured around the wearer by an attachment means 3 located in the housing 1 to which the belt is secured by a mechanism 5, such as a clip or buckle. There

is provided a switch 6 that allows the illuminable display to be powered. The device shown is designed to be secured around a person, or object, to improve visibility.

In operation, the belt 4 is withdrawn from the housing 1 and wrapped around a person or object. The belt is secured in the attachment 3, which has a retaining mechanism. The housing is then adjusted into position; for example a rear lamp would be adjusted to the back of the person. The illuminable display may then be powered by means of the electrical switch 6.

After use, the belt is released from the mechanism 3. The housing contains a stowage means, such as a spring-loaded reel, that urges the belt into a stowed position substantially within the housing 1.

Fig. 3 shows the device with the belt in the deployed configuration.

Fig. 4 shows the device with the belt in the stowed position.

Fig. 5 shows a detailed schematic view of the invention, including details of the interior of the device. The housing 1 includes a retro reflective surface 2 to the front of the housing forming an illuminable display. This surface serves to disperse the light generated inside the device from the light source 7, thereby increasing visibility. The retro reflective surface also increases the reflectivity of the surface of the device to extraneous light sources such as from the headlights of a car, again increasing visibility. The retro-reflective surface may be made of a glass or plastic transparent material, which may also be coloured. If the device is used as rear illumination, the retro-reflector would typically be coloured red or orange. A front illumination would typically be clear or coloured white. The device may also be employed without the illumination source, simply using the retroreflective surface to increase visibility.

The display is illuminated by an internal light source 7, powered by a power unit 8, which may be a battery. The light source 7 and power unit 8 are connected via wiring through an external switch 6 that allows the light source 7 to be turned on or off. The light source 7 is typically an incandescent bulb, or a light emitting diode, or an array of such light emitting diodes.

The device contains a stowage mechanism 9, such as a spring-loaded reel, shown here internal to the housing. The securing belt 4 is attached to the reel and in the stowed position the belt is wrapped around the reel. Belt 4 has a clasp mechanism 5 attached. There is provided a corresponding clasp attachment means 3 on the other side of the housing and internal to it. In the deployed position, shown in Fig. 3, the belt 4 is pulled from the housing thereby unwinding it from the reel 9. The belt can then be secured to the attachment 3 via clasp mechanism 5. After use, when the belt is unclashed, the reel 9 urges the return of the belt to the housing. This may be achieved by the spring-loaded action of the reel.

Fig. 6 shows the view of Fig. 5 from above illustrating the front and back surfaces and the top view of the internal configuration of the device. The figure includes a view of a clip 10 to the rear of the housing which is used for attaching the device for storage, for instance to a trouser belt, after use.

Further embodiments are now described by way of reference to the accompanying drawings in which:-

Fig.7: Shows schematic illustration of a further embodiment of the device. In this embodiment, there are two belts 4 and 11 attached to the housing 1. One belt 4, has a securing mechanism 5 attached to its end. There is a corresponding retaining mechanism 12 attached to the end of the other belt 11. The mechanisms 5 and 12 are designed to attach together thereby linking the ends of the belts and forming a closed loop with the housing.

Fig.8: Shows a schematic illustration of the construction of the embodiment of the device shown in Fig.7. Fig. 8 shows the view from the front including housing 1 with retro-reflective surface 2 to the front. There is an internal illumination means consisting of a light source 7 with a corresponding power unit 8 electrically attached. The power unit and light source are attached via a switch 6, external to the housing, which allows the light source to be turned on or off.

On one side of the housing, and internal to it, is a stowage means such as a spring-loaded reel 9. Attached to the stowage means 9 is a belt 4 with securing mechanism 5. On the opposite side of the housing is an identical stowage means 13. Attached to this stowage means is a second belt 11 with a retaining mechanism 12. The mechanism 12 is designed to retain the securing mechanism 5 thereby allowing the belts to be attached together. The retaining mechanism contains a release mechanism to allow the belts to be unattached. When the belts are unattached, after use, the stowage means 9&13 urge the belts 4&11 into the housing 1 for storage.

Fig. 9: Shows a schematic illustration of the construction of the embodiment of the device shown in Fig.7 in the stowed position. The belts are fully retracted into the housing 1. A part of the securing mechanism 5 and the retaining mechanism 12 protrude from the housing in order that the belts may be withdrawn from the housing for deployment.

Referring now to Fig. 7, which shows an embodiment of the device in which the attachment means consists of two belts, 4 & 11 which are deployed from either side of the housing 1. Attached to the end of one of the belts is a securing mechanism 5, such as a clasp or buckle. Attached to the end of the other belt is a retaining mechanism 12, such as a clasp retainer, which receives and secures the mechanism 5 thereby allowing the device to be secured around a person or object. Fig. 8 shows a detailed schematic view of the embodiment, including details of the interior of the device. The figure shows housing 1, retro-reflective surface 2, light source 7, power unit 8, switch 6, all of which are the same components outlined in the first embodiment in Fig.2 to Fig. 6. The figure shows belts 4&11 attached to identical stowage means 9 & 13 such as spring-loaded reels. The belts have securing mechanism 5 and retaining mechanism 12 attached to the ends of the either belt. In the

stowed configuration, the means 9&13 urge both belts to a position substantially within the housing 1, by for instance wrapping the belts around spring-loaded reels.

Fig. 8 shows the device in the deployed position, although with the belts unattached.

Fig. 9 shows the device in the stowed position. A portion of the clasp 5 and retainer 12 protrude from the device. This allows them to be easily pulled from the housing 1 for deployment.

A further embodiment of the invention consists of two devices outlined in the above embodiments, attached together to form a unit allowing front and back illumination with two devices. The devices in this case are attached to a common belt.

Claims

1. A device for enhancing the visibility of the wearer which includes a housing comprising of an illuminable display panel, a location for a power supply for the illuminable display panel, and a stowage means for stowing a belt for securing the device around the wearer. The stowage means, it enables the belt to be moved from a deployed configuration in which the belt is substantially outside the housing to a stowed configuration in which it is located substantially within the housing
2. Device according to claim 1 wherein the stowage means includes a spring-loaded reel
3. Device according to claim 1 or 2 wherein the stowage means urges the belt into the stowed configuration
4. Device according to any preceding claim wherein the illuminable display is a flashing display panel
5. A device according to any preceding claims wherein the illuminable display contains a retroreflective element that increases the visibility of the display by dispersing light in many directions
6. Device according to any preceding claim wherein the illuminable display is connected to the power supply by a switch
7. A device according to previous claims wherein the means of illuminating the display is powered by a battery connected via a switch
8. A device according to previous claims wherein the means of illuminating the display is by one or more incandescent bulbs
9. A device according to previous claims wherein the means of illuminating the display is by one or more light emitting diodes
10. Device according to any preceding claim wherein the belt is made of retro-reflecting material
11. Device according to any preceding claim wherein the belt is made of a luminous material
12. A device according to previous claims wherein the device has a clip attached to the back of the housing for attaching the device to a belt for storage after use

13. A device according to previous claims wherein the belt in the deployed configuration, is secured around the wearer by means of a securing mechanism such as a clasp and clasp retainer
14. A device according to previous claims wherein the belt is deployed from one side of the housing and in the deployed position is secured at the other side of the housing
15. A device according to previous claims wherein the securing mechanism forms a part of the housing
16. A device according to previous claims wherein two belts are deployed simultaneously from both sides of the housing and secured at an intermediate position by means of securing mechanisms such as a clasp and clasp retainer
17. A device according to previous claims wherein the illuminable display panel is red and is used to indicate the back of the wearer
18. A device according to previous claims wherein the illuminable display panel is white and is used to indicate the front of the wearer
19. A device according to previous claims wherein two such devices are connected together, one forming a front illumination source and the other forming the back illumination source.
20. A device according to previous claims where the display panel is not illuminated but the retroreflective surface increases visibility.
21. A safety device substantially as described herein with reference to figures 2 to 6.



INVESTOR IN PEOPLE

Application No: GB 0128710.1
Claims searched: 1-21

Examiner: Charles Jarman
Date of search: 26 February 2002

Patents Act 1977 Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.T): A3V, E1G (GLR)

Int Cl (Ed.7): A41D, A41F, A62B, A63K, F21V

Other: Online: WPI, PAJ, EPODOC

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0124786 A2 (LANGENBACH) See whole document.	-
A	US 5359501 (STEVENS) See whole document.	-
A	US 5245516 (DE HAAS ET AL.) See whole document.	-
A	US 2709393 (ANDERSON) See whole document.	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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